REMARKS

In response to the Office Action mailed April 1, 2002, Applicant cancelled claims 39, 42 and 43, and amended claims 1, 23, 24, 30, 31, 34, 40 and 41. Applicant also added new claims 60-65. Claims 1-32, 34-38, 40, 41 and 60-65 are presented for examination.

The Examiner rejected claims 1-29 and 34-43 under 35 U.S.C. §112, first paragraph as not being enabled by the specification. In particular, the Examiner stated:

> [T]he Applicant is claiming a composition with poor adhesion to the substrate, and it is not clear how the adhesion became poor and why the Applicant wants to use a composition with poor adhesion to the substrate, while the applications of the instant claimed invention is directed toward an adhesive coating material.

To assist the Examiner in understanding the relevant subject matter, Applicant provides a brief discussion regarding known adhesive materials in the following paragraph, and generally discusses materials developed by Applicant in the subsequent paragraph. Then, Applicant discusses the subject matter covered by the pending claims and explains where enabling support for this subject matter can be found in the application as filed.

In general, previously known coating materials (e.g., adhesives) form bonds that are essentially permanent, and removing such materials can damage the substrate to which they are bonded. (See Application as filed at 2). Some attempts have been made to provide coating materials that can be subsequently removed, but these materials generally involve the use of harsh conditions, which can also damage the substrate. (See id. at 2-3). To Applicant's knowledge, compositions that could provide good adhesion to a substrate, while also being removed from the substrate without damaging the substrate, were previously unknown. (See id. at 3).

Applicant has discovered materials that are capable of forming an adhesive bond (e.g., a bond having a shear strength of 200 psi or greater) to a substrate (e.g., an electrically conducting surface), but that can also be disbonded from the substrate without damaging the substrate. (See, e.g., id. at page 3, line 18-page 4, line 19 and page 19, lines 2-14). Generally, the materials

include a matrix functionality and an electrolyte functionality. (See, e.g., id. at page 3, line 22-page 4, line 19). The matrix functionality (e.g., a polymer, such as a curable polymer) can provide the adhesive properties to the material, and the electrolyte functionality (e.g., coordination sites on the polymer and/or an electrolyte additive) can provide an appropriate level of ionic conductivity to the material so that, when the composition forms an adhesive bond with an electrically conductive surface, the composition can support a faradic reaction that weakens the adhesive bond. (See, e.g., id. at page 5, lines 8-14, page 8, lines 10-16, page 9, line 7-page 10, line 1, page 11, line 21-page 13, line 15).

As amended, independent claims 1 and 34 and their dependent claims cover compositions that include a matrix functionality and an electrolyte functionality. The matrix functionality is capable of forming an adhesive bond to an electrically conductive surface. The electrolyte functionality is capable of providing sufficient ionic conductivity to the composition so that, when the matrix functionality forms an adhesive bond to an electrically conductive surface, the composition can support a faradic reaction at the electrically conductive surface. The faradic reaction weakens the adhesive bond.

Applicant defines the phrases "matrix functionality," "electrolyte functionality" and "faradic reaction." (Application at page 4). Numerous examples of matrix functionalities and electrolyte functions are disclosed. (See, e.g., id. at page 9, line 7-page page 13, line 15). The manner in which a faradic reaction can be induced is also disclosed. (See, e.g., id. at page 19, line 15-page 20, line 3). Moreover, numerous specific examples of how to make such materials are disclosed. (See id. page 29, line 20-page 38, line 18).

As amended, claim 30 and its dependent claims are directed to compositions that include a curable polymeric material and an electrolyte located in the curable polymeric material. When cured, the curable polymeric material can form adhesive bonds with an electrically conductive surface that have a shear strength of greater than 200 psi. The compositions have sufficient ionic conductivity to support a faradic reaction at the electrically conductive surface, wherein the faradic reaction weakens the adhesive bonds.

Applicant discloses many different curable polymeric materials that can forms bonds with a shear strength of greater than 200 psi. and electrolytes that can be disposed within the materials. (See, e.g., id. page 9, line 11-page 10, line 1).

In view of the foregoing, Applicant requests reconsideration and withdrawal of the rejection under 35 U.S.C. §112, first paragraph.

The Examiner also rejected claims 1-29 and 34-43 under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 5,441,830 ("Moulton"), alone or in combination with JP 405094818 ("NTT").

Neither of these references, alone or in combination, discloses or suggests the subject matter covered by the pending claims.

Moulton is directed to electrically conducting adhesion promoters for enhancing the adhesion of composite electrodes onto conductive foils useful as current collectors. (Moulton col. 1, lines 11-15). The articles disclosed by Moulton essentially contain a three layer combination of a foil and a composite electrode with an adhesive material therebetween. (See, e.g., id. col. 3, lines 20-55). Apparently, Moulton's adhesive can form an adhesive bond, but the adhesive does not contain an electrolyte. (Id. col. 5, line 8-col. 7, line 2). Moreover, while Moulton's electrode can be a composite cathode that contains a polymer and a salt, this material does not appear to be capable of forming an adhesive bond to an electrically conductive surface. (Id. col. 8, lines 13-17). In short, nowhere does Moulton disclose a material that can form an adhesive bond and that also has sufficient ionic conductivity to support a faradic reaction at an electrically conductive surface, where the faradic reaction weakens the adhesive bond. Thus, Moulton does not disclose Applicant's claimed compositions.

Nor is there any suggestion to modify Moulton to provide such compositions. Rather, whereas the pending claims cover materials that can form an adhesive bond and that have a certain level of ionic conductivity (e.g., so that the adhesive bond ***weakens*** under conditions of electrical current), Moulton is concerned with providing an adhesive material that can ***strengthen*** adhesion under conditions of electrical current. (See, e.g., id. col. 2, lines 19-35). Moreover, whereas Moulton is concerned with preparing materials having certain ***electronic conductivity*** properties, the materials covered by the pending claims require particular ***ionic conductivity*** properties. As known to those skilled in the art, these can be two very different problems. Thus, one skilled in the art would have never considered Moulton in the first place, and even if one skilled in the art did somehow consider Moulton, that person would not have been motivated to modify Moulton's compositions to provide the compositions covered by the pending claims.

NTT does not cure Moulton's infirmities. NTT simply discloses a material containing phase separated polymer and electrolyte for use as a battery cathode. This material does not appear to be capable of forming an adhesive bond, nor does the material appear to be capable of forming an adhesive bond that is weakened by the passage of electricity, as required by the claims.

Neither Moulton nor NTT, alone or in combination, discloses or suggests the compositions covered by the claims. There is no suggestion to combine these references to provide such compositions. Furthermore, even if the references were combined, the result would not be the subject matter covered by the claims. Rather, the result would apparently be a material that lacked the ability to form an adhesive bond and/or that lacked the ability to form an adhesive that is weakened by the passage of electricity. Accordingly, Applicant requests reconsideration and withdrawal of the rejection under 35 U.S.C. §103.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be allowed. Enclosed is a Petition for Extension of Time (three months extension) of time and check made out in an amount to cover the appropriate fee associated with the Petition for Extension of Time. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: [illegible]

Sean P. Daley
Reg. No. 40,978

Fish & Richardson P.C.
225 Franklin Street
Boston, Massachusetts 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

20505424.doc

Version with markings to show changes made

In the specification:

Paragraph beginning at page 12, line 12 was amended as follows:

--The electrolyte functionality of the disbondable composition provides ionic conductivity sufficient to maintain a faradic reaction at an interface with an electrically conductive surface. Sufficient conductivity may be readily established by preparing a composition and applying a voltage across a bondline with an electrically conductive substrate. If current flow is observed, a faradic reaction at the bondline may be assumed. Sufficient ionic conductivity also may be empirically observed by applying a voltage across the bondline and noting whether the bond is weakened. Compositions with ionic conductivities in the range of 10^{-11} to 10^{-5} [S/cm^2] S/cm at room temperature are considered within the scope of the invention. Materials having higher conductivities require shorting disbonding times. Compositions with ionic conductivities in the range of 10^{-9} to 10^{-7} [S/cm^2] S/cm at room temperature are preferred.--

In the claims:

Claims 39, 42 and 43 were cancelled.

The claims were amended as follows.

--1. (Once Amended) [An electrochemically disbondable] A composition [having], comprising:

a matrix functionality [and an electrolyte functionality, said matrix functionality] capable of providing an adhesive bond to [a substrate,] an electrically conductive surface and [said] an electrolyte functionality providing sufficient ionic conductivity to said composition [to] so that, when said matrix functionality forms said adhesive bond to said electrically conductive surface, said composition can support a faradic reaction at [an interface with an] said electrically conductive surface [in contact with said composition, whereby said adhesive bond is weakened at said interface], said faradic reaction weakening said adhesive bond.

23. (Once Amended) The composition of claim 1 or 9, wherein said composition has [a] an ionic conductivity in the range of 10^{-11} S/cm to 10^{-5} [S/cm^2] S/cm.

24. (Once Amended) The composition of claim 1 or 9, wherein said composition has [a] an ionic conductivity in the range of 10^{-9} S/cm to 10^{-7} [S/cm^2] S/cm.

30. (Once Amended) [An electrochemically disbondable] A composition, comprising:

a curable polymeric material [having]; and

an electrolyte located [therein] in said curable polymeric material,

wherein said [uncured] curable polymeric material, when cured, [provides in combination with said electrolyte, sufficient ionic conductivity to support a faradic reaction at a surface in electrical contact with an electrode] can form adhesive bonds with an electrically conductive surface, said adhesive bonds having a shear strength of greater than 200 psi, and said composition has sufficient ionic conductivity to support a faradic reaction at said electrically conductive surface, said faradic reaction weakening said adhesive bonds.

31. (Once Amended) The composition of claim 30, wherein said curable polymeric material is selected from the group consisting of epoxy resins, phenolic resins, acrylic resins, melamine resins, [malemide] maleimide resins and urethanes.

34. (Once Amended) A bonded structure, comprising:

[two electrically conductive surfaces; and

a bond between said two surface, said bond including:

the electrochemically disbondable composition of claim 1 or 9]

a first material layer having an electrically conductive surface;

a second material layer having an electrically conductive surface; and

a composition disposed between the electrically conductive surface of the first material layer and the electrically conductive surface of the second material layer, the composition, comprising:

a matrix functionality; and

an electrolyte functionality,

wherein:

the matrix functionality forms an adhesive bond to the electrically conductive surface of the first material layer, and

the electrolyte functionality provides sufficient ionic conductivity to the composition so that the composition can support a faradic reaction at the electrically conductive surface of the first material layer, the faradic reaction weakening said adhesive bond.

40. (Once Amended) The bonded structure of claim 34, wherein at least one of said [electrically conductive surfaces] first and second material layers is an electrically conductive coating applied to a substrate.

41. (Once Amended) The bonded structure of claim 36, wherein at least one of said [electrically conductive surfaces] first and second material layers is an electrically conductive coating applied to a substrate.--